MICROFINANCE INSTITUTIONS' MISSION DRIFT IN MACROECONOMIC CONTEXT

Shufang Xu, James Copestake and Xinman Peng

2015

Forthcoming in the Journal of International Development

(pre-publication draft)

Abstract: We theoretically discuss the potential macroeconomic influences on MFIs' depth of outreach and provide empirical evidence, using panel analysis, to investigate determinants of average loan balance per borrower as a percentage of national GNI per capita (ALB), as a proxy indicator for poverty focus or depth of outreach. ALB is found to be positively associated with operational self-sufficiency, a finding that is consistent with the mission drift hypothesis. But it is also positively associated with the shares in GDP of net foreign direct investment (FDI) and domestic credit to the private sector (DCPS). This suggests mission drift is associated not only with MFI-specific factors, but also influence by macroeconomic context.

Keywords: microfinance; mission drift; depth of outreach; financial performance; social performance; macroeconomic influences

1 INTRODUCTION

In the last decade, microfinance institutions (MFIs) have grown rapidly in many developing countries. Many differ from commercial financial institutions, which aim solely for profit-maximization, by combining a social mission with financial performance goals. Although their social mission varies, most MFIs focus on reducing poverty and promoting social inclusion by tailoring the financial services they offer to demand from relatively poor people. In recent years this has been affected by a trend from non-profit status towards full commercialization. This raises the question of mission drift - whether profit-seeking behavior is resulting in less emphasis on serving poor customers.

Fulfillment of the social mission of MFIs can be measured by outreach to poor clients, taking into account both number of clients and how poor they are, or breadth of outreach and depth of outreach. Social mission also includes outreach to women customers (Bhatt & Tang, 2001; Cull et al. 2007; Mersland & Str∅m, 2010; Hermes et al., 2011; Quayes, 2012; Louis et al., 2013). In microfinance, breadth of outreach is mainly measured by the number of people the MFI provides financial services to (especially credit) over a specific period. Depth of outreach is related to the income level of borrowers: the poorer they are in money terms the greater the depth of outreach. Outreach to women customers is usually measured by the percentage of women borrowers to total borrowers. With the tremendous growth in microfinance in the last decade, plenty of MFIs have significantly expanded breadth of outreach (Quayes, 2012). At the same time, outreach to women

customers has been fairly high and stable (Cull et al., 2007; Hermes et al., 2011; Quayes, 2012; Louis et al., 2013). In relation to the discussion of outreach in microfinance, the primary focus of academics is on depth of outreach, and this is also the focus of our paper.

In this paper, with respect to the mission drift issue, we contribute to the literature in two ways. First, after controlling for MFI-specific variables, the empirical results show that the potential trade-off between MFIs' financial performance and depth of outreach depends upon the macroeconomic environment. Second, we discuss potential influences of the macroeconomic environment on MFIs' depth of outreach and provide empirical evidence in support of theoretical hypotheses linking the two. To our knowledge, there are a very few studies in the microfinance literature that empirically explore how depth of MFI outreach is affected by theirfinancial performance and macroeconomic environment aspect simultaneously. Drawing on data for 218 MFIs in 76 countries between 2001 and 2011, this paper uses panel models to investigate determinants of average loan balance per borrower as a percentage of national GNI per capita (ALB), as a proxy indicator for depth of outreach. ALB is found to be positively associated with operational self-sufficiency, a finding that is consistent with the mission drift hypothesis. But it is also positively associated with the shares in GDP of net foreign direct investment (FDI) and domestic credit to the private sector (DCPS).

The rest of this paper is organized as follows. Section 2 provides an overview of the literature. Section 3 elaborates on the potential influences of macroeconomic environment on MFIs' depth of outreach. Section 4 provides a description of the data source and variables. Section 5 demonstrates empirical evidence on the determinants of depth of outreach combining both MFIs' financial performance and the macroeconomic environment aspect. Section 6 provides conclusions and discusses the implications of our results.

2 LITERATURE REVIEW

In terms of the measure of depth of outreach, there are some differences among microfinance researchers. Average loan balance per borrower is widely used as the proxy for depth of outreach (Bhatt & Tang, 2001; Schreiner, 2002; Mersland & Strøm, 2010; Hermes et al., 2011). These researchers argue that the smaller loan size is consistent with poorer borrowers' loan demand. Bigger average loan balance per borrower implies less depth of outreach. But Christen (2000) predicts that larger loan balances of more commercial MFIs do not definitely represent mission drift, as it is possibly related to these MFIs' choice of strategy, period of entering the microcredit market, or rising borrowing capacity of the target customers. Armendáriz and Szafarz (2011) also argue that MFIs extending larger loan sizes to borrowers does not necessarily mean that those MFIs have shifted away from their social mission as MFIs may be cross subsidizing, which is more possible in countries or regions where there is a large unbanked population that includes not only very poor people but also better-off customers. Some researchers use average loan size per borrower/GNI or GNP per capita as the proxy for depth of outreach (Cull et al.， 2007; Quayes, 2012; Louis et al., 2013).[1] This focuses research on the extent to which MFIs depart from a general trend towards larger loans in richer countries or regions where they are located. In our

[1]Cull et al. (2007) also use average loan size/GNP per capita of poorest 20% of population as an additional variable for measuring depth of outreach.

study, we use average loan size per borrower/GNI per capita as the proxy for depth of outreach.[2]

On the issue of whether mission drift has occurred among MFIs recent empirical research does not reach aconsistent conclusion. (Mersland & Str∅m, 2010; Quayes, 2012; Louis et al., 2013). Mersland & Str∅m(2010) use average loan size as their main proxy and MFIs' lending methodology, and main market (urban/rural) and gender as further measures of mission drift. They use a GMM estimator based on 379 MFIs in 74 countries during the period 1998-2008 to estimate whether MFIs depart from their social mission by catering to better off customers. Their analysis indicates no significant increase in average loan size or the fraction of urban customers for these MFIs.. But their regressions do reveal that an increase in average profit and average cost is associated with increased average loan size and other measures of mission drift, implying mission drift may occur if MFIs seek higher financial returns. In a more recent study, Quayes (2012) uses data from 702 MFIs operating in 83 countries to reveals a positive complementary relationship between depth of outreach and financial sustainability for high-disclosure MFIs[3]; but for low-disclosure MFIshe finds evidence that is consistent with a trade-off between outreach and financial sustainability. Louis et al. (2013) investigate the association between social performance and financial performance of MFIs using self-organizing maps methodology. Their results show that there is a significant positive relationship between social and financial performance.

The debate over whether MFIs drift from their social mission as they aim at better-off customers has also been exploredI as a potential trade-off between social performance and financial performance, . where depth of outreach is an important proxy for measuring social performance. (Copestake, 2007; Cull et al., 2007; Hermes et al., 2011). Copestake (2007) provides a theoretical framework for analysing trade-offs between financial and social performance. He suggests that mission drift can more precisely be defined as *ex post* changes in stated preferences to fit unplanned performance outcomes., He reviews the extent to which poverty oriented MFIs are able to avoid mission drift through better social performance management, and explores the scope for more systematic balancing of social and financial goals across national retail financial services sectors. Cull et al. (2007) show trade-offs emerge between profitability and serving the poorest through analyzing financial performance and outreach of 124 MFIs in 49 developing countries from 1999 to 2002. They find that this depends on an MFI's lending method, that charging high interest rates does not ensure greater profitability, and that the benefits of cost-cutting diminish when MFIs serve better-off clients. Their evidence also illustrates the possibility of earning profits while serving poor clients. Moreover, Cull et al. (2007) find the

[2]Some researchers also use lending methodology as a further mission drift measure (Mersland & Str∅m, 2010). They point out that MFIs mainly adopt group lending methodology for poorer customers, but for better-off borrowers, MFIs mainly adopt individual lending methodology. Those MFIs which have higher ratio of individual lending methodology may also be experiencing mission drift. We think that using lending methodology as the proxy for depth of outreach may be misleading. Microfinance has been developing over thirty years around the world, and more and more MFIs have adopted the individual lending mode because itis more flexible and simple for customers. E MFIs that have been operating in the microfinance market for a long time and have accumulated plenty of borrowers' credit informationdo not need to rely on group guarantees as a collateral substitute any longer. For example, while Grameen Bank in Bangladesh originally advocated group lending methodology, but subsequently relaxed the binding guarantee responsibility of group members.

[3] High disclosure MFIs provide more accurate information to the Mix Market (Quayes, 2012).

positive relationship between profitability and average loan size is insignificant in their base regressions. However, they find that larger loan sizes are related to lower average costs for both individual-based lenders and solidarity group lenders. Hermes et al. (2011) provide strong evidence that outreach is negatively associated with efficiency of MFIs by using stochastic frontier analysis for 435 MFIs from year 1997 to 2007. They find that MFIs having lower average loan balances and more female borrowers are less efficient. Their research suggests that improving cost efficiency may only be achieved by focusing less on the poor for MFIs.

Other researchers have revealed additional complexity in the determinants of MFIs' depth of outreach by investigating macroeconomic factors beyond MFI specific characteristics. (for example, Marconi & Mosley, 2006; Krauss & Walter, 2009; Ahlin et al., 2011; Annim, 2012; Vanroose & D'Espallier, 2013). Annim (2012) and Vanroose and D'Espallier (2013) both find that macroeconomic environment also affects MFIs' outreach and performance in addition to institution-specific characteristics. Annim (2012) asserts that there exists complementarity between the external environment such as credit information, property rights and financial development, and MFIs' social performance. He employs both parametric and non-parametric efficiency estimation techniques based on data for 164 MFIs over the period 2004-2008, finding that bureaucracies in property registration and a lack of credit information negatively influence the social performance of MFIs.

3 MACROECONOMIC INFLUENCES ON MFIs MISSION DRIFT

In this section we discuss in turn how domestic financial development, foreign direct investment, inflation, percent of rural population and credit information of the countries in which MFIs operate influence the depth of outreach of MFIs.

Domestic financial development

Surprisingly few studies have investigated the relationship between financial development and MFIs' outreach. Vanroose and D'Espallier (2013) indicate that MFIs reach more clients and are more profitable in countries where access to traditional banking services is low. They attribute this result to market-failure: MFIs perform better where the formal financial sector fails. But they also demonstrate that MFIs' depth of outreach is greater in countries with more developed financial systems, where banks and MFIs stand in more direct competition with each other. They argue that more intense competition may hold MFIs down market, and thereby make mission drift less likely.

In contrast, in a study based on data collected from 362 MFIs in 73 countries, Assefa et al. (2013:778) find that while access to private credit from banks and other regulated financial institutions is negatively associated with breadth of outreach it is positively and significantly correlated with loan size. In a developed financial system, MFIs may find it easier to engage with wealthier individual customers who can absorb larger loans: a process referred to as MFI "upscaling". But direct competition from commercial banks for those clients also forces MFIs to lend larger amounts. Consequently, the depth of outreach of MFIs, as measured by average loan size, may be lowered. This highlights the complexity of the relationship between the financial development and the depth of outreach of MFIs. In a most competitive financial system they have to balance competing with commercial banks by upscaling with competing with each other and with "downscaling" commercial banks for poorer clients. MFIs not only face competition from

commercial banks for wealthier individual customers, microenterprises and small enterprises, but also for traditional microfinance customers. Thus variation in MFI's average loan size may reflect the combination of selectively moving up market, and moving down market to sustain or enlarge their share in the microfinance market.

Foreign direct investment

Foreign direct investment may have direct and indirect negative influences on the depth of outreach of MFIs. On the one hand, FDI may have a direct negative impact on the depth of outreach of MFIs. In recent years, in the light of commercialization in microfinance, more and more foreign investors have entered the microfinance industry due to its profitability and light regulation in many developing countries. Foreign direct investors especially those profit-oriented investors in the microfinance industry usually emphasize the financial performance of MFIs they invest in rather than their social performance. Vanroose & D'Espallier (2013) reveal in their study of 1,073 MFIs that more FDI is associated with higher profitability for MFIs. MFIs in receipt of FDI, especially more commercially oriented FDI, may prefer to extend larger loans to wealthier or better-off clients than to provide small loans to poorer customers. If so, this would explain a direct negative association between FDI and the depth of outreach of MFIs.

In addition, FDI may have an indirect negative influence on the depth of outreach of MFIs. Greater FDI inflows may raise wage employment and create demand complementarities raising the borrowing capacity of potential clients, encouraging MFIs to offer larger loans, , as predicted by Ahlin et al. (2011). As the loanable funds of MFIs are constrained by limited financial resources, this may cause MFIs to reduce the loan portfolio allocated to the poor. Thus, depth of outreach of MFIs may be lowered.

Inflation

Inflation may be negatively related to the depth of outreach of MFIs. Vanroose and D'Espallier (2013) show that MFIs' profitability is negatively associated with inflation. Ahlin et al. (2011) reveal that inflation is consistently and strongly correlated with MFI's higher average interest rate and high cost of funds. MFIs may respond to inflation with upward interest rate adjustments. They also predict that higher inflation leads to slower (real) loan-size growth of MFIs. We argue that inflation may cause MFIs to react by increasing the portion of larger loans to relatively wealthier clients, as the poor customers are more vulnerable to higher borrowing costs and inflation risk. Moreover, poor customers' demand for microloans may be more weakened as compared to wealthier clients. In this sense, inflation may be negatively associated with the depth of outreach of MFIs.

Rural poverty rate

Rural poverty rate is the percentage of the rural population living below the national rural poverty line. Many MFIs primarily operate in rural areas. Theoretically, to have higher depth of outreach in rural areas, MFIs need a higher percentage of the rural population to be living under the rural poverty line, thus rural poverty rate may be positively associated with depth of outreach of MFIs. To some extent, higher rural poverty rate is related to lower economic development level in rural areas. Only a few studies discuss the relationship between rural poverty rate and depth of outreach. Some researchers just use percent of rural population as a measure of poverty level

(Ahlin et al., 2011; Assefa et al., 2013; Vanroose & D' Espallier, 2013). We argue that the percent of rural population is not necessarily associated with poverty level. MFIs may have fewer opportunities for extending microloans to wealthier individual customers, microenterprises and small and middle-sized enterprises in areas with higher rural poverty rate. Furthermore, poor customers in these areas rely more heavily on MFIs for borrowing funds as compared to the clients in other areas. Hence, poor borrowers in areas with higher rural poverty rate may have greater credit discipline which is beneficial to reducing MFIs' default ratio, providing incentive for MFIs to reach greater depth of outreach. In summary, rural poverty rate may be positively related to depth of outreach of MFIs.

Credit information

By credit information we refer to the scope, accessibility and quality of information about outstanding loans available through public and private credit reporting systems. From a theoretical perspective, depth of credit information may have a positive influence on the depth of outreach of MFIs. Availability of reliable credit information is very important for MFIs to make efficient lending decisions, especially when the borrowers lack eligible collateral or appropriate third-party guarantors, which is very common among MFIs' customers. In this case, reliable credit information may act as a partial substitute for collateral and borrower guarantees. An efficient credit reporting system is beneficial to reducing information asymmetry between credit transaction parties, to alleviating borrowers' moral hazard and adverse selection problems. It helps to improve MFIs' credit risk management, to strengthen credit constraints on the borrowers and to raise the availability of microloans. Hence, depth of credit information provided by credit reporting system should have a positive impact on the depth of outreach of MFIs.

Overall, as discussed above, the influences of macroeconomic environment on the depth of outreach of MFIs are complex. We will empirically estimate the potential impact of the domestic financial development, foreign direct investment, inflation, percent of rural population and credit information on the depth of outreach of MFIs in section 5.

4 DESCRIPTION OF DATA AND VARIABLES

In order to reveal whether there is a potential trade-off between MFIs' financial performance and depth of outreach, and to explore the impact of country-specific macroeconomic environment on the depth of outreach, we set up panel models based on observation for 218 MFIs in 76 countries during the period 2001- 2011. The MFI data in our sample are sourced from the Microfinance Information Exchange (MIX) market database. MIX is a global web-based microfinance information platform which provides the most comprehensive and up-to-date information on MFIs' financial performance and outreach. Most of the empirical studies in the microfinance literature use data from this source. However, this information does have limitations. First, while it is audited most of the data is self-reported. Second, there is the problem of self-selection of MFIs into the sample. In order to minimize the problems mentioned above, we select MFIs in the MIX Market database according to three criteria: first, we select only MFIs that belong to the highest two levels out of five levels of data quality;[4] second, in each country, we randomly choose no more than four MFIs to make our

[4]The MIX market classifies reporting MFIs into five categories (one-diamond through to five-diamonds) based upon its assessment of the amount and reliability of information reported.

sample more representative; third, since there are missing values for some MFIs in several years, we only select MFIs that have available information over five years during the period 2001-2011. Hence, while not strictly representative of all MFIs operating, the data for those selected is relatively reliable and comprehensive.

The data we use for country-specific macroeconomic environment variables are all sourced from the World Development Indicators (WDI). WDI is World Bank' primary collection of development indicators, compiled from officially-recognized international sources. It presents the most current and accurate global development data available.

The dependent variable in our model is average loan balance per borrower / GNI per capita (ALB). The independent variables include three categories: financial performance variables, MFI-specific control variables and macroeconomic environment variables.

We use four indicators to measure financial performance of MFIs: operational self-sufficiency (OSS), return on equity (ROE), financial revenue divided by average total assets (FRA), and the loan portfolio at risk >30 days ratio (PAR30). The MFI-specific control variables are AGE and SCALE. Our model also includes FDI, DCPS, INF, CD and RPR as the country-level macroeconomic environment variables. FDI denotes net inflows of foreign direct investment (% of GDP), DCPS refers to domestic credit to private sector (% of GDP), INF represents annual percentage rate of consumer price inflation,[5] CD denotes credit depth of information index and RPR refers to rural poverty rate. The further explanations of all variables in the empirical analysis are presented as follows:

(a) Dependent variable: Average loan balance per borrower / GNI per capita (ALB)

As discussed in Section 1, average loan balance per borrower divided by GNI per capita is the main proxy used for depth of outreach in microfinance. Greater value of ALB is generally believed to imply lower depth of outreach, thus, greater possibility of mission drift.

(b) Financial performance variables

Operational self-sufficiency (OSS) is the main indicator used for measuring an MFI's financial performance. It is defined as financial revenue divided by total expense which equals the sum of financial expense, loan loss provision expense and operating expense. The value of OSS greater than 100% implies that the MFI has sufficient revenue to cover its costs and is operationally sustainable. OSS is widely used by researchers for discussing the relationship between financial sustainability and outreach of MFIs (for example, Cull et al., 2007; Copestake, 2007; Ahlin et al., 2011; Serrano-Cinca & Gutiérrez-Nieto, 2014; Quayes, 2012). ROE measures the utilization efficiency of equity capital and profitability of MFIs. FRA is the ratio of financial revenue to average total assets, and a proxy for the average interest rate charged by MFIs. PAR30 is the fraction of the loan portfolio at risk for more than 30 days past due. PAR30 is an early risk warning indicator of loan default problems and hence a measure of loan portfolio quality. This indicator is also widely used in microfinance research (for example, Cull et al.,2007; Gonzalez, 2007; Mersland & Str∅m, 2010; Ahlin et al., 2011; Louis et al., 2013).

[5]Since the effect of inflation has a time lag, we constructed the index with a one year time lag.

(c) MFI-specific Control variables

Here, we define two MFI-specific control variables as dummy variables. First, AGE measures the number of years since a MFI was established. This variable is classified into three categories: new, young and mature. A MFI categorized as new has operated no more than five years, and categorized as young has operated between five and eight years. When a MFI has operated more than eight years, it is categorized as mature. The variable takes the value of one if the MFI is new, the value of two for the young MFI and three for the mature MFI respectively.

Second, SCALE reflects the portfolio scale of a MFI and is classified into three levels: small, medium and large. The scale of an MFI's portfolio depends on the region in which it operates. An MFI categorized as small has a portfolio of less than $2 million in all regions except Latin America and the Caribbean (LAC) where it is defigned as having a portfolio of less than $4 million. When the MFI's portfolio is between $2 and $8 million it is categorized as medium in all regions except LAC where the range is between $4 and $15 million. An MFI categorized as large has a portfolio exceeding $8 million in all regions except LAC, where the minimum is $15 million. We give a value of one for a small MFI, two for medium, and three for large.

(d) Country-specific macroeconomic environment variables

DCPS refers to the private credit to GDP ratio, such as through loans, purchase of non-equity securities, and trade credits. This indicator is one of the most accepted measures of the domestic financial development of a country in the finance and growth literature (King and Levine, 1993; Levine, 2005). FDI is also an important macroeconomic environment indicator. FDI can be regarded as a proxy measure for the economic openness of a country. Inflation (INF) is measured by the consumer price index. . Credit depth of information index (CD) is used for measuring rules affecting the scope, accessibility, and quality of credit information available via public or private credit registries. The index ranges from zero to six, the higher the value the greater the coverage depth and better the quality of information. Rural poverty rate (RPR) is the percentage of the rural population living below the national rural poverty line.

(e) Descriptive statistics of variables

Table 1 provides the descriptive statistics of the variables we have used in the empirical analysis.

Table 1. Descriptive statistics of variables

Variable	Mean	Std. Dev.	Min	Max	N
ALB	0.772683	1.866444	0	34.5017	2102
FRA	0.274866	0.124102	0	1.1671	1967
ROE	0.102836	0.236429	-2.7561	2.4421	1969
OSS	1.195775	0.372586	0	6.6722	2101
PAR30	0.050506	0.070141	0	0.9634	1921
AGE	2.585072	0.667159	1	3	2157
SCALE	2.183465	0.826639	1	3	2153
FDI	0.046239	0.05352	-0.02499	0.538108	2377
DCPS	0.323721	0.251318	0.007735	1.67536	2351
INF	0.107416	0.406046	-0.13226	7.286657	2291
CD	3.305006	2.138231	0	6	1718
RPR	0.4616515	0.1899768	0.088	0.834	743

Next we calculate the mean values of MFIs' outreach and financial performance variables in each year during the period 2001-2011 to acquire the change trend of variables. Mean values of MFIs' outreach and financial performance variables are summarized in Table 2.

Table 2. Mean values of MFIs' outreach and financial performance variables

YEAR	ALB	FRA	PAR30	ROE	OSS
2001	65.87%	30.21%	4.71%	6.17%	112.91%
2002	74.00%	30.50%	5.37%	10.63%	120.17%
2003	74.23%	28.58%	5.62%	7.17%	119.77%
2004	70.69%	28.30%	4.70%	12.26%	125.41%
2005	83.19%	27.61%	4.52%	11.43%	121.17%
2006	86.15%	27.52%	4.00%	11.23%	119.76%
2007	94.67%	26.62%	3.38%	12.38%	126.03%
2008	74.09%	28.26%	4.40%	13.64%	121.44%
2009	70.99%	25.74%	6.46%	7.83%	113.69%
2010	76.57%	25.95%	6.55%	7.33%	115.42%
2011	71.74%	26.61%	5.94%	10.14%	116.91%

Table 2 presents mean values of outreach and financial performance variables of the 218 MFIs during the period 2001-2011. It shows that average loan balance per borrower / GNI per capita (ALB) increased from 2001 to 2007, but then fell sharply, and has since fluctuated. Financial revenue divided by assets (FRA) decreased from 2001 to 2011. The fraction of the loan portfolio at risk for more than 30 days past due (PAR30) fluctuated without trend during 2001-2007, but increased significantly from 2007 to 2010.. Return on equity (ROE) also fluctuated during the period. In each year between 2001 and 2011, the mean value of operational self-sufficiency (OSS) was greater than 100%, revealing most of the MFIs in the sample were operationally sustainable, although this probably also reflects self-selection of MFIs reporting to the MIX market.

Table 3 provides mean values of the macroeconomic environment variables. It shows that

foreign direct investment of the countries in which MFIs operate increased on average during the specific period. Domestic credit to private sector as a percentage of GDP increased significantly during 2001-2011, from around 26% in 2001 to 40% in 2011, which indicates more credit resources were provided to the private sector, and the overall financial depth of the countries had improved. Consumer price inflation fluctuated during the period, while the rural poverty rate generally decreased over the period. Credit depth of information index increased substantially over the period, indicating a general improvement in the availability of credit information in most of the countries covered.

Table 3. Mean values of macroeconomic environment variables

YEAR	FDI	DCPS	INF	RPR	CD
2001	0.028371	0.260904	0.205627	0.5838889	N/A
2002	0.03131	0.252457	0.168551	0.4733953	N/A
2003	0.038204	0.26114	0.069291	0.513675	N/A
2004	0.043209	0.272177	0.066996	0.5483269	2.282297
2005	0.042357	0.292154	0.067647	0.4915869	2.629108
2006	0.057737	0.313881	0.077498	0.4915869	2.934579
2007	0.066161	0.356199	0.070511	0.4533333	3.191589
2008	0.060455	0.377019	0.071189	0.435803	3.528037
2009	0.042358	0.385946	0.129669	0.4248333	3.747706
2010	0.045846	0.393353	0.186962	0.3859745	3.986239
2011	0.051505	0.400419	0.072246	0.4099984	4.077982

Lastly, the description of institutional-specific variables is summarized in Table 4. As the MIX market imposes strict data quality criteria on the reporting MFIs (including requiring MFIs to provide audited financial reports for at least three consecutive years) it is easily understandable that the majority of MFIs in the sample are labeled mature institutions and are relatively large scale.

Table 4. Description of institutional-specific variables

（Total observations：2398）

Variables	Number of observations	Percentage
AGE		
new	218	9.09%
young	459	19.14%
mature	1480	61.72%
missing	241	10.05%
SCALE		
small	574	23.94%
medium	610	25.44%
large	969	40.41%
missing	245	10.22%

5 MODELS AND EMPIRICAL RESULTS

As explained above, the focus of our empirical analysis is on revealing whether there is a trade-off between MFIs' financial performance and depth of outreach, and exploring macroeconomic influences on the depth of outreach. In addition, we include two MFI-specific control variables, which may also influence the depth of outreach of MFIs. We set up five panel models adding the five macroeconomic environment variables (DCPS, FDI, INF, CD and RPR) progressively. The five equations we estimate are as follows:

$$ALB_{it} = \partial_{it} + \beta_1 OSS_{it} + \gamma_1 ROE_{it} + \theta_1 PAR30_{it} + \delta_1 FRA_{it} + \phi_1 AGE_{it} + o_1 SCALE_{it} + \varepsilon_1 DCPS_{it} + \mu_{it} \quad (1)$$

$$ALB_{it} = \partial_{it} + \beta_2 OSS_{it} + \gamma_2 ROE_{it} + \theta_2 PAR30_{it} + \delta_2 FRA_{it} + \phi_2 AGE_{it} + o_2 SCALE_{it} + \varepsilon_2 DCPS_{it} + \varphi_2 FDI_{it} + \mu_{it} \quad (2)$$

$$ALB_{it} = \partial_{it} + \beta_3 OSS_{it} + \gamma_3 ROE_{it} + \theta_3 PAR30_{it} + \delta_3 FRA_{it} + \phi_3 AGE_{it} + o_3 SCALE_{it} + \varepsilon_3 DCPS_{it} + \varphi_3 FDI_{it} + \lambda_3 INF_{it} + \mu_{it} \quad (3)$$

$$ALB_{it} = \partial_{it} + \beta_4 OSS_{it} + \gamma_4 ROE_{it} + \theta_4 PAR30_{it} + \delta_4 FRA_{it} + \phi_4 AGE_{it} + o_4 SCALE_{it} + \varepsilon_4 DCPS_{it} + \varphi_4 FDI_{it} + \lambda_4 INF_{it} + \omega_4 CD_{it} + \mu_{it} \quad (4)$$

$$ALB_{it} = \partial_{it} + \beta_5 OSS_{it} + \gamma_5 ROE_{it} + \theta_5 PAR30_{it} + \delta_5 FRA_{it} + \phi_5 AGE_{it} + o_5 SCALE_{it} + \varepsilon_5 DCPS_{it} + \varphi_5 FDI_{it} + \lambda_5 INF_{it} + \omega_5 CD_{it} + \tau_5 RPR_{it} + \mu_{it} \quad (5)$$

$$i = 1, 2, \ldots\ldots, 218; \quad t = 1, 2, \ldots\ldots 11$$

Before doing the estimations, we use Stata 12 to determine the appropriate form of each model (fixed or random effects) by using the Hausman chi-square test,. A fixed effects model imposes time independent effects for each entity that is possibly correlated with the regressors, whereas random effects model assumes regressors are uncorrelated with the unobserved effect. The results of the Hausman chi-square test show that in equations (1), (2), (3) and (4), fixed effects model is more reasonable than random effects model. Hence we chose the fixed effects model in equations (1), (2), (3) and (4), and a random effects model in equation (5).

Table 5 summarizes the regression outputs from the panel models estimated using fixed effects or random effects, columns (1) to (5) present the results of the estimations for equations (1) to (5) respectively.

Table 5. Results of the estimations

	ALB (1)	ALB (2)	ALB (3)	ALB (4)	ALB (5)
Financial performance variables					
OSS	0.2212842 (0.0884523)**	0.2121955 (0.0893312)**	0.2146888 (0.0920021)**	0.142687 (0.1104206)	0.8015921 (0.4372436)*
ROE	-0.2005854 (0.1254003)	-0.1919521 (0.125475)	-0.2105213 (0.1303082)	-0.2961807 (0.1665464)*	-0.8369889 (0.6611307)
PAR30	-0.4775848 (0.3793168)	-0.4523179 (0.3807982)	-0.467626 (0.3913379)	-0.6004214 (0.4918093)	-0.8882009 (1.210639)
FRA	-0.8569826 (0.3302692)***	-0.7842007 (0.3321774)**	-0.8220889 (0.3438451)**	-0.9330875 (0.5146514)*	-2.369158 (0.9672638)**
Control variables					
AGE	-0.1266028 (0.0530951)**	-0.1221182 (0.0537188)**	-0.1224487 (0.0566625)**	-0.1038815 (0.0766925)	-0.3213243 (0.2177161)
SCALE	0.0535097 (0.0478662)	0.0564701 (0.0480089)	0.0506952 (0.049882)	0.0468618 (0.0707035)	0.2582502 (0.1418698)*
Macroeconomic variables					
DCPS	0.5514174 (0.2645816)**	0.500011 (0.2696553)*	0.5965572 (0.2876747)**	1.084237 (0.3754186)***	0.398675 (0.6007716)
FDI		1.112355 (0.4979058)**	1.05415 (0.5150914)**	1.153535 (0.616103)*	3.372368 (1.646138)**
INF			0.0350879 (0.0701251)	0.0383394 (0.0751981)	0.8448131 (1.297333)
CD				-0.0366482 (0.0252071)	-0.081777 (0.0533116)
RPR					0.4053339 (0.5966754)

Notes: *, ** and *** denote statistical significance at the 10%, 5% and 1% levels respectively, and SEs are listed in parentheses.

In columns (1) (2) (3) and (5), we find the coefficient of the primary financial performance variable OSS is positive and highly significant. In addition, in column (4), the coefficient of OSS is also positive, though not significant. This suggests average loan size per borrower/ GNI per capita increases with the improvement of operational self-sufficiency, which implies there is a potential trade-off between financial sustainability and the depth of outreach of MFIs. We infer from this that for MFIs pursuing higher OSS, there is a risk of mission drift, proxied by reduced depth of outreach. . This result is in line with the findings of Cull et al. (2007) and Hermes et al. (2011), but in contrast with the conclusions of Mersland & Str∅m (2010), Quayes (2012) and Louis et al. (2013).

Interestingly, the coefficient of ROE is negative and significant at the 10% level in column (4), which implies that after allowing for the influences of DCPS, FDI, INF and CD on the depth of outreach MFIs which reach poorer customers can also achieve more favorable returns on equity. The coefficient of PAR30 is not significant in all columns, thus the relationship between PAR30 and depth of outreach in the empirical analysis remains uncertain. Not surprisingly, the coefficient of FRA is negative and significant in each column, which confirms that smaller loans are associated with higher interest rates, reflecting the differential pricing strategy across MFIs.

With respect to the correlation between macroeconomic environment variables and the depth of outreach, the results in columns (1) through (5) suggest the following. First, Table 5 shows that in all columns, DCPS is positively correlated with average loan size per borrower/ GNI per capita, though in column (5) the coefficient is not significant. This result suggests that higher credit availability from the private sector might be negatively associated with the MFIs' depth of outreach. This is in line with the findings of Assefa et al. (2013) and Vanroose & D'Espallier (2013), and with the argument that financial development is associated with MFI upscaling reduced depth of outreach. Second, in columns (2) to (5) FDI is positively and significantly related to ALB in all four specifications, which is consistent with the theories advanced that it can directly and/or indirectly induce upward mission drift. Third, the coefficient of the variable INF in columns (3) to (5) is positive, bu statistically insignificant. Fourth, the coefficients of the variable CD in columns (4) and (5) are both negative, but not significant. Last, the association between RPR and ALB remains uncertain in column (5). Overall, we find some evidence that macroeconomic environment is closely related to depth of outreach of MFIs, especially with respect to financial development and openness, as measured by DCPS and FDI respectively.

In terms of the potential impact of institutional-specific control variables on depth of outreach, AGE is negatively and significantly associated with ALB in columns (1) to (3), indicating that younger MFIs may be more inclined to target wealthier borrowers, this perhaps indicating a kind of collective mission drift at the 'industry level.' In recent years, with increasing commercialization in microfinance, younger MFIs especially those regulated and commercial MFIs may focus on serving better-off customers, thus having larger ALB as compared to older MFIs. Other literature has demonstrated a negative correlation between age of MFIs and financial performance (Hermes et al., 2011; Mersland et al., 2011; Barry & Tacneng, 2014). This is consistent with the theory that younger MFIs disburse larger loans to wealthier customers in order to achieve better financial performance. The coefficient of SCALE is positive and significant at the 10% level in column (5) when including all five macroeconomic variables in the panel model, which implies that larger scale MFIs may be negatively related to depth of outreach since they usually provide larger loans to clients as compared to smaller scale MFIs. This result is consistent

with the findings of Mersland et al. (2011) and Assefa et al. (2013) which show that the assets size of MFIs is positively and significantly correlated with average loan size.

6 CONCLUSIONS AND IMPLICATIONS

In recent years, MFIs in many developing countries have turned to focus on financial benefits rather than social performance and opted to extend larger loans to better-off customers, gradually departing from their original social mission. This raises the question of mission drift. In this paper, we try to empirically reveal whether there is indeed a potential trade-off between MFIs' financial performance and depth of outreach, and also explore macroeconomic influences on MFIs' depth of outreach.

With respect to the mission drift issue, our empirical results support the view that there is a potential trade-off between MFI's operational self-sufficiency and depth of outreach. This is in line with the findings of Cull et al.(2007), Hermes et al. (2011), but in contrast with the conclusions of Mersland & Strøm (2010), Quayes (2012) and Louis et al. (2013). However, we also find the sample's financial revenue to average total assets ratio is significantly negatively associated with depth of outreach which confirms that smaller loans are associated with higher interest rates.

Turning to the potential influences of country-specific macroeconomic environment on MFIs' depth of outreach, our empirical results show that both foreign direct investment and domestic private credit availability are negatively and significantly associated with MFIs' depth of outreach. This is consistent with the hypothesis that MFI mission drift is partly driven by external economic factors.

In terms of the potential impact of institutional-specific control variables on MFIs' depth of outreach, the empirical results confirm that a more commercial focus on better-off clients by MFIs may result in lower depth of outreach. Our findings also imply that older MFIs reach poorer borrowers, and larger scale MFIs may be negatively related to depth of outreach as they provide larger loans to their customers.

The results of the paper show that concern about MFIs mission drift should take into account not only their own strategic choices but also wider macroeconomic influences. MFI-specific factors such as financial targeting do not give the whole picture when discussing the determinants of MFIs mission drift. We need to investigate more deeply the influence of country-specific factors also.

REFERENCES

Ahlin C, Lin J, Maio M. 2011. Where does microfinance flourish? Microfinance institution performance in macroeconomic context. *Journal of Development Economics* **95**:105-120.

Annim SK. 2012. Microfinance efficiency: trade-offs and complementarities between the objectives of microfinance institutions and their performance perspectives. *European Journal of Development Research* **24**:788–807.

Armendáriz B, Szafarz A. 2011. On mission drift in microfinance institutions. In *The handbook of microfinance*, Armendáriz B, Labie M (eds). World Scientific.

Assefa E, Hermes N, Meesters A. 2013. Competition and the performance of microfinance institutions.

Applied Financial Economics **23**:767-782.

Augsburg B, Fouillet C. 2010. Profit empowerment: The microfinance institution's mission drift. *Perspectives on Global Development &Technology* **9**: 327-355.

Barry TA ,Tacneng R. 2014. The impact of governance and institutional quality on MFI outreach and financial performance in Sub-Saharan Africa. *World Developmen*t **58**:1–20.

Bhatt N, Tang S. 2001. Delivering microfinance in developing countries: controversies and policy perspectives. *Policy Studies Journal* **29**: 319-333.

Christen RP. 2000. Commercialization and mission drift: the transformation of microfinance in Latin America. *CGAP Occasional Paper*: 1-49.

Copestake J. 2007. Mainstreaming microfinance: social performance management or mission drift? *World Development* **10**: 1721-1738.

Cull R, Demirgüç-Kunt A, Morduch J. 2007. Financial performance and outreach: a global analysis of leading microbanks. *Economic Journal*, **117**(517): 107–133.

Gonzalez A. 2007. Resilience of microfinance institutions to national macroeconomic events: an econometric analysis of MFI asset quality. *MIX Discussion Paper No.1*, 1-25..

Hermes N, Lensink R, Meesters A. 2011. Outreach and efficiency of microfinance institutions. *World Development* **39(6)**: 938-948.

King RG, Levine R. 1993. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* **108**: 717-737.

Krauss NA, Walter I. 2009. Can microfinance reduce portfolio volatility? *Economic Development and Cultural Change* **58**(1): 85-110.

Levine R. 2005. Finance and growth: theory and evidence. In *Handbook of Economic Growth*, Aghion P, Durlauf S (eds). Elsevier Science: Amsterdam.

Louis P, Seret A, Baesens B. 2013. Financial efficiency and social impact of microfinance institutions using self-organizing maps. *World Development* **46**: 197-210.

Marconi R, Mosley P. 2006. Bolivia during the global crisis 1998-2004: towards a 'macro economics of microfinance'. *Journal of International Development* **18**: 237-261.

Mersland R, Strøm R∅. 2010. Microfinance mission drift? *World Development* **38**: 28-36.

Mersland R, Randøy T, Strøm R∅. 2011. The impact of international influence on microbanks' performance: A global survey. *International Business Review* **20**:163-176.

Quayes S. 2012. Depth of outreach and financial sustainability of microfinance institutions. *Applied Economics* **44**: 3421–3433.

Schreiner M. 2002. Aspects of outreach: a framework for discussion of the social benefits of microfinance. *Journal of International Development* **14**(5): 591-603.

Serrano-Cinca C, Gutiérrez-Nieto B. 2014. Microfinance, the long tail and mission drift. *International Business Review* **23**(1): 181-194.

Vanroose A, D'Espallier ĘB. 2013. Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development and microfinance institutions' outreach and performance. *Applied Economics* **45**: 1965-1982.